UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Strumenti e Applicazioni del Web

2526-1-F9202P003-F9202P00301

Aims

The educational objectives of this teaching are practical-applicative and conceptual-theoretical in nature.

Knowledge and Understanding

This course aims to provide students with knowledge and skills related to the main tools and information technologies used in Web application development. The teaching path offers an overview that begins with the creation of the Internet and the Web and continues through to the most recent developments. Technological aspects will first be introduced and then explored in greater depth, allowing students not only to use Web tools effectively, but also to pursue individual areas of interest more thoroughly. The course will focus on functional and user-oriented aspects, as well as on selected market dynamics within the Web ecosystem.In addition, the course will examine the features of the most popular social media platforms and explore recent developments in both social and mobile Web technologies.

Applying Knowledge and Understanding

Knowledge and understanding of the underlying dynamics of the most relevant technical, applicative, and economic aspects of the Web.

Autonomy of Judgment

The course aims to foster autonomy of judgment and critical thinking in the use of information technologies. These skills will be developed through the analysis and discussion of case studies.

Communication Skills

Development of the ability to communicate technical content, ideas, problems, and related solutions clearly, effectively, and unambiguously to different audiences. These skills will be assessed during the examination process.

Learning Skills

The degree program is structured to provide both theoretical knowledge and practical skills, establishing a solid foundation for further exploration of the functioning of digital tools and applications. The proposed training effectively prepares students to pursue further studies independently into the Master's degree programs with a focus on technical and computer science-related topics. The learning skills acquired will be assessed through examination activities.

Contents

The course will cover the following topics: computer networks and network protocols (basic concepts, local area networks, wide area networks, the Internet); the Web, its standards, and Web languages (differences between Internet and Web, the Web's graph structure, static Web/dynamic Web, semantic Web, main languages); Web browsers, their history, and main features; major Web services and applications; social media (and the social Web); issues of privacy and data security on the Web; challenges related to natural language processing, particularly generative artificial intelligence; current tools for creating online content (blogs, content management systems, automation tools, tools for data analysis and infographic generation).

Detailed program

Introduction to computer networks and network protocols

- Basic concepts
- Local area networks
- Geographic networks
- The Internet
- Networking protocols
- The Web and Introduction to its Standards

The Web and introduction to its standards

- Difference between the Internet and the Web
- The graph structure of the Web
- Static Web/Dynamic Web (and paradigms Web 1.0, Web 2.0)
- Semantic Web (Web 3.0 paradigm)
- Social Web

Security and confidentiality on the Web

- Cryptography
- Cookies
- Malware
- Proxies
- Referral links

Web browsers, history and role

- Introduction
- Interfaces

- Evolution
- Impact

Introduction to technologies and languages for generating Web applications

- HTML
- CSS
- DOM
- Wordpress

Natural Language Processing and the Web

- Introduction to NLP and basic concepts of textual representation
- Generative Artificial Inteligence
- Sentiment analysis

The access to information

- Search engines
- Recommender systems

Hints of SEO, Digital Marketing, and Digital Economy

- Optimization of On-Page and Off-Page Content
- Some Tools for SEO

Social media

- Introduction
- Graph theory
- Complex network theory
- Social Network Analysis metrics

Prerequisites

The course assumes that the students have a certain familiarity with main web access tools (browsers and search engines). It is also useful some level of experience with the most diffused social media (Facebook, Twitter, Youtube).

Teaching form

The type of teaching activity is partitioned between lectures and laboratory. The didactic mode of theoretical lectures consists of 21 in-person lecture-based classes of 2 hours each one and 8 in-person laboratory interactive classes of 3 hours each one. Some lessons may be delivered remotely in a lecture-interactive format.

Theoretical and methodological aspects will be presented along with practical examples and case studies, employed to exemplify the introduced topics. The course has a partly laboratory approach: students are asked to experiment several online applications, among the most diffused, and to build a personal presence on different social media.

Textbook and teaching resource

Slides of the frontal lessons, including links to additional suggested material (papers, articles, blogs).

Semester

First semester.

Assessment method

The learning evaluation will be through a written test, containing both open-ended questions and closed-ended tests. A project consisting of a thematic Web blog created in groups (2-max 3 people) is also due.
There are no ongoing tests.

The assessment of the written exam, which will focus on the topics covered during the lectures, will be in thirtieths;

The assessment of the website is group-based, and will be in thirtieths. In particular:

- There will be an assessment part, related to the Web Tools and Applications module, which will consider the aspects of the website related to the topics covered during the Labs of that module;
- There will be an assessment part, relating to the Principles of Social Psychology for Web Design module, which will consider aspects of the site relating to the topics covered during that module.
- The overall assessment, in thirtieths, will be an average of the mark obtained in the written exam and the overall mark obtained for the thematic website.

The examination and assessment procedures will be explained in detail during the first lesson of the Web Tools and Applications course.

Office hours

By appointment.

Sustainable Development Goals